

TWO NEW SPECIES OF THE GENUS *PHORBIA* (DIPTERA, ANTHOMYIIDAE) FROM CHINA

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Abstract Two species of genus *Phorbia* (Diptera, Anthomyiidae), *P. subcurvifolia* and *P. sinosingularis* are found new to science in China and are described. A key to species of *Phorbia* in China was provided. All the type specimens are deposited in Shanghai Entomological Museum, Chinese Academy of Science.

Key words Diptera, Anthomyiidae, *Phorbia*, new species, China.

Introduction

The genus *Phorbia* was erected in 1830 by Robineau-Desvoidy and is distributed in the Holarctic and Northern Oriental Regions. Over 50 species were recorded in the world and 27 species were found in China before this research.

Species of the genus *Phorbia* are small to medium-sized, scutellum often bare ventrally, with a pair of interfrontalia setae and blackish coloured, stocky anthomyiids. The foraging of the flies is mainly on feeding grasses, the larvae of some species of *Phorbia* damage wheat.

The present paper describes two new species, *Phorbia subcurvifolia* and *Phorbia sinosingularis*; *P. subcurvifolia* belongs to *longipilis* species group, which divided by Ackland and Michelsen in 1986 and 1993, because of these morphological characters: surstyli simple and tapering in caudal view, inner margin mesally with setulae, cercal plate heart-shaped, with only a few longer setae at apex. But there is not a suitable group to place *Phorbia sinosingularis* now.

All the type specimens are deposited in Shanghai Entomological Museum, Chinese Academy of Science.

1 *Phorbia subcurvifolia* sp. nov. (Figs 1 – 5)

Holotype ♂, China, Heilongjiang, Mt. Daxinganling (51.7° N, 126.6° E), 7 May 1980, CUI Chang-Yuan leg.

Description. ♂, medium-sized, length of body 6.0 mm.

Colour. Interfrontalia gray black, parafacialia and gena gray black, with silver pollinosity; palpi gray black and slender, prementum piceous. Thorax black, and in dark gray pollinosity, with a median gray streak and a pair of sub-median gray streak. Base of wings brown, calypters whitish, halteres pale yellow-brown.

Legs all black.

Head. Eyes bare; frons a little narrower than outer edge of the distance between two posterior ocelli, interfrontalia distinctly wider than anterior ocellus, with a strong pair of interfrontal setae, parafacialia with 7 pairs of frontal setae, mixed with short hairs among frontal setae, and a pair of fronto-orbital setae, parafacialia as wide as postpedicel, arista short pubescent, epistoma not protruded as far as parafrontal angle, postoculars short, occiput only laterally with hairs.

Thorax. prothoracic depression, notopleuron, hypopleuron bare; posthumeral setae 1 + 2; notopleural setae 1 + 1; sternopleural setae 1 + 3; no anepisternal setae; propleural setae 2; dorsocentral setae 2 + 3; acrostical 3 + 5; prostigmal setae 4 – 5; prealar setae longer than anterior and posterior notopleural setae; ventral surface of scutellum bare, center of dorsum of scutellum also bare; apical scutellar setae short. Edge of scutellum with hairs.

Wings. Costal vein with a pair of costal spines; lower calypter not protruded as far as upper calypter; m-m cross-vein straight.

Legs. Femora of fore and mid legs with silver pollinosity; fore femur with a row of pv-setae; fore tibia with 1 pd-seta and 2 pv-setae; mid femur with a row of av-setae; mid tibia with 2 av-setae, 1 ad-seta, 2 pd-setae and 3 pv-setae; all hind legs missing.

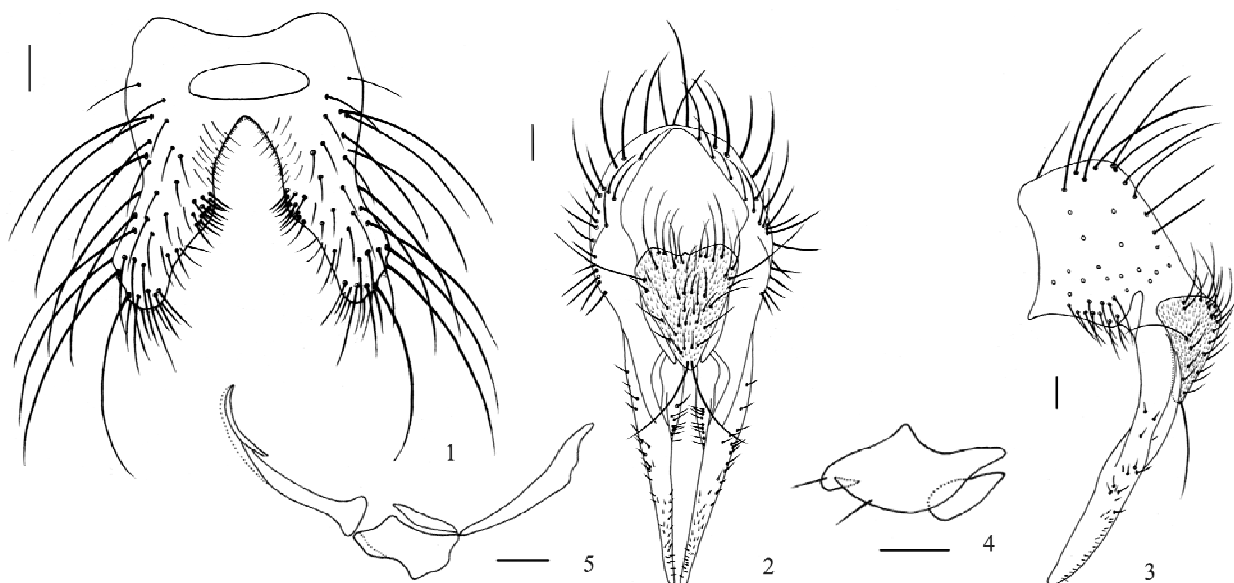
Abdomen. Oblong-cylindrical; tergite I + II and tergite III both with a dark anterior edge; tergite VI bare.

Terminalia. Base of sternite V piceous, as shown in Fig. 1; surstyli and cercal plate as in Figs 2 – 3, shape of cercal plate approximate heart-shaped; gonites as in Fig. 4; aedeagus as shown in Fig. 5.

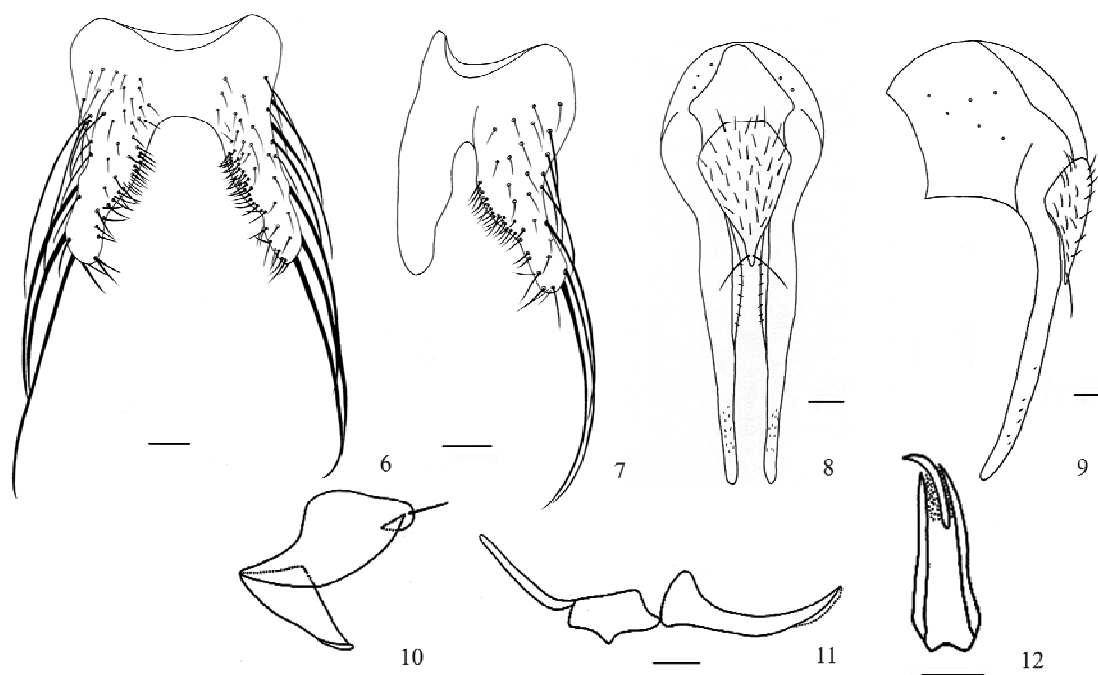
♀ Not identified.

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Figs 1–5. *Phorbia subcurvifolia* sp. nov., male. 1. Sternite V (ventral view). 2. Surstylus and cercal plate (rear view). 3. Surstyli and cercal plate (lateral view). 4. Gonites (lateral view). 5. Aedeagus (lateral view). Scale bars = 0.1 mm.



Figs 6–12. *Phorbia sinosingularis* sp. nov., male. 6. Sternite V (ventral view). 7. Sternite V (lateral view). 8. Surstyli and cercal plate (rear view). 9. Surstylus and cercal plate (lateral view). 10. Gonites (lateral view). 11. Aedeagus (lateral view). 12. Aedeagus (ventral view). Scale bars = 0.1 mm.

Remarks. This new species is very similar to *Phorbia curvifolia* Hsue in the shape of cercal plate and sternite V, but can be distinguished in the following aspects: only 1 seta on the lower tip of pregonite, another setae on the edge of pregonite behind the lower tip, the extrusion of the acrophallus not acute, fore tibia with 2 pv-setae, mid tibia with 2 av-setae, 3 pv-setae.

Etymology. Latin prefix “*sub*” (close to) indicate that the species is similar to *Phorbia curvifolia* Hsue.

2 *Phorbia sinosingularis* sp. nov. (Figs 6–12)

Holotype ♂, China, Shanxi, Wenshui County (37.4° N, 112.0°E), 6 May 1976, collector unknown.

Description. ♂, length of body 6.0 mm.

Colour. One-third of forepart of interfrontalia black, two-third of back of interfrontalia yellow; parafacialia and gena gray black, with silver pollinosity; palpi gray black; prementum gray black.

Thorax black in ground colour, with piceous pollinosity. Base of wings brown, calypters yellow-white, halteres yellow-brown; Abdomen brown. Legs all gray black.

Head. Eyes with sparse micro-hairs; frons twice as wide as anterior ocellus; interfrontalia with a strong pair of interfrontal setae, parafrontalia with 7 pairs of frontal setae, near frontal setae with some hairs; a pair of short fronto-orbital setae; parafacialia as wide as postpedicel; the height of gena 4/3 times as wide as parafacialia; postpedicel not quite twice as long as pedicel; arista short pubescent or almost bare, prementum short; epistoma not protruded as far as parafrontal angle apparently; peristomal setae 3 and three rows of up-curved peristomals; occiput only laterally with hairs.

Thorax. Prothoracic depression, notopleuron, hypopleuron bare; posthumeral setae 2 + 2; notopleural setae 1 + 1; sternopleural setae 1 + 3; no mesopleural seta; propleural seta 2; acrostical setae 3 + 6; dosocentral setae 2 + 3; prealar seta longer than anterior and posterior notopleural seta; intra-alar setae 3; ventral surface of scutellum bare, center of dorsum of scutellum also bare; apical scutellar seta short. Edge of both sides of scutellum with 3 hairs.

Wings. Costal vein with a pair of strong costal spines; lower calypter not protruded as far as upper calypter; m-m cross-vein straight.

Legs. Fore femur with a row of pv-setae; fore tibia with 2 av-setae and 1 ad-seta; mid femur with a row of a-setae and av-setae, 2 pd-setae; mid tibia with 1 av-seta, 1 ad-seta, 2 pd-setae and 2 pv-setae; hind femur with 7 av-setae, a row of ad-setae, 4 pv-setae; hind tibia with 3 ad-setae, 3 av-setae, 4 pd-setae and 1 d-seta (apical dorsal seta).

Abdomen. Oblong-conical.

Terminalia. The base of sternite V piceous, as shown in Figs 6 – 7; epandrium, cercal plate and surstyli as in Figs 8 – 9; gonites as in Fig. 10; aedeagus as in Figs 11 – 12 (after finishing drawing, aedeagus missing).

♀ Not identified.

Remarks. The species is very similar to *Phorbia singularis* Tiensuu in the postpedicel not quite twice as long as pedicel, scutellum bare ventrally, the shape of the sternite V very similar, and mid tibia with 2 pv-setae. But the new species may be distinguished in following aspects: the setae of all tibiae, the shape of cercal plate different, the aedeagus and the surstyli, and also the species is similar to *Phorbia asiatica* Hsue, such as the sternite V, the surstyli in lateral view; but still has differences: the gonites and aedeagus different, the shape of cercal plate, a pair of short fronto-orbital setae, fore tibia without pv-setae.

Etymology. The species is very similar to *Phorbia singularis*, Latin prefix “*sino*” (China) indicates it is found in China.

Key to the species of *Phorbia* Robineau-Desvoidy known from China (Males).

1. Cercal plate distinctly asymmetrical 2
Cercal plate basically symmetrical 7
2. Entire length of costal vein without haired ventrally 3
At least the base of costal vein haired ventrally 4
3. Surstyli with distinctly expansion in lateral view *P. funiuensis* Ge et Li
Surstyli not with distinctly expansion in lateral view *P. obliqua* Fan et Zheng
4. Entire length of costal vein with haired ventrally 5
Costal vein haired ventrally before sub-costal vein 6
5. The end of cercal plate's right side twisted out, surstyli with downward groove *P. omeishanensis* Fan
The end of cercal plate's right side blunt and round, the lateral view of the middle part of surstyli wide, rear view of the end of surstyli twisted out *P. fani* Hsue
6. Surstyli distinctly asymmetrical; the lateral view of the left side of cercal plate long and thin, the end of it sharp *P. tysoni* Ackland
Surstyli basically symmetrical; the lateral view of the left side of cercal plate oval, the end of it blunt and round *P. nepalensis* Suwa
7. Scutellum not haired ventrally 8
Scutellum haired ventrally 16
8. The end of cercal plate with clustering and curly hairs 9
The end of cercal plate with sparse and vertical hairs 10
9. The end of cercal plate haired densely and long; the rear view of the inside of surstyli straight, lateral view of the base of surstyli wide *P. pascicularis* Tiensuu
The end of cercal plate sparse and short; the rear view of the inside of surstyli curve, lateral view of the base of surstyli thin *P. erlangshana* Feng
10. The inside of sternite V without protuberance 11
The inside of sternite V with protuberance 13
11. With a series fine hairs submedially on inner margin of sternite V 12
Without a series fine hairs submedially on inner margin of sternite V *P. simplisternita* Fan, Li et Cui
12. Rear view of cercal plate like heart-shaped *P. subcurvifolia* sp. nov.
Rear view of cercal plate like hexagon *P. kochai* Suwa
13. Frons wide 14
Frons narrow 15
14. The width of frons 1.5 or 2.0 times as the width of anterior ocellus; the rear view of end of cercal plate sharp, not divided into two parts *P. curvifolia* Hsue
The width of frons equal to the width of anterior ocellus; the rear view of cercal plate divided into two parts *P. morulella* Fan, Li et Cui
15. The rear view of cercal plate almost trilateral, the length of cercal plate 3.5 times as its height *P. asiatica* Hsue
The rear view of cercal plate almost heart-shaped, the length of cercal plate 3 times as its height *P. sinosingularis* sp. nov.
16. Mid tibia with av-setae 17
Mid tibia without av-setae 22
17. The whole costal vein haired ventrally 18
At most the base of costal vein haired ventrally 20
18. The end of cercal plate bifurcate *P. genitalis* (Schnabl)
The end of cercal plate not bifurcate 19
19. Hind tibia with 3 ad-setae, 3 pv-setae *P. gemmullata* Feng, Liu et Zhou

- Hind tibia with 5 ad-setae, 4 pv-setae *P. longipilis* (Pandellé)
20. The end of cercal plate not bifurcate *P. pilostyla* Suwa
The end of cercal plate bifurcate 21
21. Mid tibia with 1 pv-seta; hind tibia with 2 pd-setae, 3 pv-setae; the rear view of cercal plate like accumbent hourglass
..... *P. curvicauda* (Zetterstedt)
Mid tibia with 2 pv-setae; hind tibia with 3 or more pd-setae, 1 pv-seta; the rear view of cercal plate like oblong-ovoid
..... *P. polystrepsis* Fan, Chen et Ma
22. The end of cercal plate divided into two parts 23
The end of cercal plate flat, or at most very shallow division 24
23. Two lobes of the end of cercal plate symmetrical
..... *P. semicircinata* Fan et Zheng
Right lobe of cercal plate a little longer than the left lobe 25
24. Hind tibia with 3 or more pd-setae, 1–2 pv-setae; the end of cercal plate with a shallow division *P. morula* Ackland
Hind tibia with only 3 pd-setae, 0–1 pv-seta; the end of cercal plate with a deep division *P. subsymmetrica* Fan
25. Fore tibia with ad-setae 26
Fore tibia without ad-setae 27
26. Fore tibia with 1 pv-seta; the inside edge of sternite V with clustering seta medially; the end of cercal plate with long hairs
..... *P. lobata* Hockett
Fore tibia with 2 pv-setae; the inside edge of sternite V with small hairs, without dense clustering hairs medially 28
27. The inner of the lobes of sternite V concave
..... *P. hypandrium* Li et Deng
The inner of the lobes of sternite V not concave
..... *P. lobatoides* Suwa
28. 1 row of up-curved peristomals; fore tibia with 1 pv-seta; mid tibia with 0 ad-seta, 1 pd-seta; hind tibia with 4 av-setae, 6 ad-setae, 6 pd-setae, 1 pv-seta *P. vitripennis* Fan
3 rows of up-curved peristomals; fore tibia with 2 pv-setae; mid tibia with 1 ad-seta, 2 pd-setae; hind tibia with 2–3 av-setae, 2–3 ad-setae, 4 pd-setae, 1–2 pv-setae
..... *P. pectiniforceps* Fan, Wang et Yang

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REFERENCES

- Ackland, D. M. 1967. A note on *Phorbia genitalis* (Schnabl) and *P. securis* Tiensuu (Dipt. Anthomyiidae). *Entomologist's Monthly Magazine*, 103: 52.
- Ackland, D. M. and Michelsen, M. 1986. The Palearctic species of the *Phorbia curvicauda* (Zetterstedt) group (Diptera; Anthomyiidae). *Entomologica Scandinavica*, 17: 423–432.
- Ackland, D. M. 1993. Revisionary notes on the genus *Phorbia* (Diptera; Anthomyiidae) with descriptions of three new species from the Czech Republic and Georgia (Palearctic, Region). *European Journal of Entomology*, 90: 209–226.
- Cui, C-Y 1998. Anthomyiidae. In: Xue, W and Zhao, J (eds.), Flies of China. Liaoning Science and Technology Press, Shenyang. 1: 737–742.
- Fan, Z-D, Chen, Z-Z and Fang, J-M 1987. Diptera; Anthomyiidae, Muscidae, Calliphoridae, Sarcophagidae. In: Zhang, S (ed.), Agricultural Insects, Spiders, Plant Diseases and Weeds of Xizang, Xizang People Press, Xizang. 1: 299–300.
- Fan, Z-D 1988. Economic Insect Fauna of China (Diptera; Anthomyiidae). Science Press, Beijing. 37: 132–143.
- Fan, Z-D and Zheng, S-S 1992. Diptera; Anthomyiidae. In: Chen, S (eds.), Insects of the Hengduan Mountains Region, Science Press, Beijing. Vol. 2. 1: 152–154.
- Hennig, W. 1976. Anthomyiidae (part). In: Linder, E. (ed.), Die Fliegen der palaearktischen Region. 63a: X VIII – XLVI.
- Suwa, M. 1974. Anthomyiidae of Japan (Diptera). *Insecta Matsumurana*, 4: 1–180.
- Suwa, M. 1994. The genus *Phorbia* in Nepal, with descriptions of five new species (Diptera; Anthomyiidae). *Insecta Matsumurana*, 50: 1–52.
- Tiensuu, L. 1935. Die bisher aus Finnland bekannten Musciden. *Acta Societatis pro Fauna et Flora Fennica*, 58 (4): 14–18.
- Tiensuu, L. 1938. Beiträge zur Kenntnis der Musciden (Diptera) Finnlands. *Suomen Hyönteistieteellinen Aikakauskirja. Annales Entomologici Fennici*, 4 (1): 21–25.

中国草种蝇属二新种记述 (双翅目, 花蝇科)

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摘要 记述中国草种蝇属 (双翅目, 花蝇科) 2 新种 *P. subcurvifolia* sp. nov. 和 *P. sinosingularis* sp. nov., 并附上尾器绘图, 编制了中国本属 29 种雄成虫检索表。模式标本保存于中科院上海昆虫博物馆。

类弯叶草种蝇, 新种 *P. subcurvifolia* sp. nov. (图 1~5)

雄虫与 *P. curvifolia* 近似, 区别如下: 前阳基侧突具 2 鬃, 两鬃着生位置不同, 基阳体突出部分较平钝, 前胫具 2 后腹鬃, 中胫具 2 前腹鬃、3 后腹鬃。

关键词 双翅目, 花蝇科, 草种蝇属, 新种, 中国。

中图分类号 Q969.454.1

正模 ♂, 黑龙江省大兴安岭, 1980-05-07, 崔昌元采。

词源: 新种根据其与弯叶草种蝇近似而命名。

华异草种蝇, 新种 *P. sinosingularis* sp. nov. (图 6~12)

雄虫与 *P. singularis* 和 *P. asiatica* 近似, 区别如下: 肛尾叶端部尖锐, 侧尾叶内侧具小刚毛列, 前阳基侧突仅具 1 鬃, 后阳基侧突端部较尖锐, 前胫无后腹鬃。

正模 ♂, 山西省文水县, 1976-05-06, 采集人不详。

词源: 新种根据其采自中国且近似于异草种蝇而命名。

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